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1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
		FINAL/01 JUN 91 TO 31 MAY 94

4. TITLE AND SUBTITLE

LOCALIZATION PEHNOMENON IN SOME
RANDOM CLASSICAL SYSTEMS (U)

5. FUNDING NUMBERS

6. AUTHOR(S)

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2304/A4
AFOSR-91-0243

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

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8. PERFORMING ORGANIZATION REPORT NUMBER

AFOSR-TR- 9 5 - 0 2 0 7

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

AFOSR/NM
110 DUNCAN AVE, SUITE B115
BOLLING AFB DC 20332-0001

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

AFOSR-91-0243

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT

APPROVED FOR PUBLIC RELEASE: DISTRIBUTION IS UNLIMITED

12b. DISTRIBUTION CODE

UL

13. ABSTRACT (Maximum 200 words)

For the reported period the researchers focused on several problems on the propagation of electromagentic and acoustic waves in periodic and disordered media. (1) Localization properties of some discrete models for light. (2) Existence of gaps and exponential localization for the Anderson type models for periodic and disordered acoustic dielectric media and (3) Band-gap structure for periodic two component dielectric and acoustic media.

19950403 052

14. SUBJECT TERMS			15. NUMBER OF PAGES
			16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	SAR(SAME AS REPORT)

NSN 7540-01-280-5500

DTIC QUALITY INSPECTED I

Standard Form 298 (Rev. 2-89)

AFOSR-91-0243

FINAL TECHNICAL REPORT
on the research project
"Localization Phenomenon in Some
Random Classical Systems"

A. Figotin

July 20, 1994

For the reported period I focused on several problems on the propagation of electromagnetic and acoustic waves in periodic and disordered media.

- Localization properties of some discrete models for light, [1,2]

- Existence of gaps and exponential localization for the Anderson type models for periodic and disordered acoustic and dielctric media, [3,6,7]

- Band-gap structure for periodic two component dielectric and acoustic media, [4,5,8]

The detailed information on the work done was presented in the annual reports as well as copies of the papers and preprints which have been already sent to the Air Force Office of Scientific Research.

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Justification	

By
Distribution/
Availability Codes

| Dist | Avail and/or Special |
| A-1 | |

Papers Published and Submitted

[1] *The Localization Properties of a Random Steady Flow on a Lattice* Journal of Statistical Physics, **66**, 1599-1612, 1992

[2] *One Model of a Nonhomogeneous Medium Conducting Light*, Journal of Statistical Physics, **69**, 969-993, 1992.

[3] *Existence of Gaps in the Spectrum of Periodic Structures on a Lattice* Journal of Statistical Physics, **73**, 571-585 , 1993.

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[5] *Photonic Psuedogaps for Periodic Dielectric Structures*, Journal of Statistical Physics, **74**, 433-446, 1994

[6] *Localizaation Phenomenon in Gaps of the Spectrum of Random Lattice Operaators*, Journal of Statistical Physics, **75**, 997-1021, 1994 (with A. Klein)

[7] *Localizaation of Electromagnetic and Acoustic Waves in Random Media. Lattice Model*, Journal of Statistical Physics, **76**, 885-1003, 1994 (with A. Klein)

[8] *Band-Gap Structure of the Spectrum of Periodic Dielectric and Acoustic Media. I. Scalar model*, (submitted), 1994 (with P. Kuchment)